DOCUMENT RESUME

ED 305 048 IR 013 724

AUTHOR Tirman, W. Robert
TITLE U.S. Telecommunications and Trade Policies: The Need for an Effective Information Age Model.
PUB DATE Oct 88
NOTE 58p.; Paper presented at the Telecommunications Policy Research Conference (16th, Airlie House, Warrenton, VA, October 30-November 1, 1988). For other papers of this conference, see IR 013 715-735.
PUB TYPE Information Analyses (070) -- Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Federal Regulation; *International Trade; Models; *Networks; *Policy Formation; Public Policy; *Technological Advancement; *Telecommunications
IDENTIFIERS *Federal Communications Commission

ABSTRACT

This paper examines the need for telecommunications and international trade policies in the Information Age and presents a model for developing such policies. The first of seven sections discusses the need for an Information Age Model, and the technological changes that are giving rise to increasingly integrated Information Age networks are examined in the second. The third section then reviews the Federal Communications Commission's (FCC) efforts in its "Computer III" decisions to adapt telecommunications policy to facilitate the advent of intelligent networks and advanced integrated systems. The fourth section shows how trade policy is gradually addressing the technological advances and resulting changes in the marketplace, while the FCC's current efforts to define an appropriate telecommunications and trade model are examined in the fifth section together with its track record in past attempts to influence U.S. access to foreign markets. Threshold principles that might be incorporated into a possible model for U.S. decision-makers are discussed in the sixth section, and the final section concludes by reemphasizing Digital Corporation's hope that this paper will serve as a catalyst for forward-thinking analysis of a sound U.S. approach for the Information Age. (194 footnotes) (EW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED305048

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

U.S. Telecommunications and Trade Policies:

The Need for An Effective Information Age Model

presented by

DIGITAL Equipment Corporation

October 1988

IR013724

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
W.Robert Tirman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Table of Contents

Page

Section I — There Is A Need for An Effective Information Age Model 3

A. Technological Advances and Changing Market Conditions Have Made Traditional Models Obsolete 3

B. The Absence of an Information Age Model Creates Serious Risks of Inconsistent and Counterproductive U.S. Actions 4

Section II — Technological Advances Have Led to An Increasingly Integrated Information Age Marketplace 5

A. The Network of the 1960s Was Profoundly Affected by the Advent of the Computer Age 7

B. Technological Advances Have Greatly Expanded Internal Network Telecommunications Capabilities 8

1. Advances in Transmission Facilities 8

a. Developments in Packaging of Transmitted Information 9

b. Developments in Transmission Media 10

2. Advances in Network Switching Facilities 11

3. The Advent of Intelligent Networks 12

C. Technological Advances in "External" Computing Systems and Applications Allow Performance of Many Functions Previously Offered Only by the Network 13

D. The Information Age Network of the Future Will Be an Open, Intelligent Transmission Highway 15

Section III — Telecommunications Policy Is Evolving to Reflect Changing Technological Realities 15

A. Computer III Recognized the Changing Technology and Marketplace 16

B. ONA Will Facilitate the Advent of the Information Age Network 20

Section IV — Telecommunications Trade Policy Is Evolving to Address U.S. Concerns 21

A. Telecommunications Trade Has Become An Important Priority for U.S. Trade Policy 21

B. Trade Negotiations and U.S. Trade Law Have Focused on Discrete Components 24

Page

C. The New Telecommunications Trade Legislation Underscores the Need To Develop an Overall Strategy 27

D. The Fragmentation of U.S. Policymaking Complicates Development of a Consistent National Policy 28

Section V — The FCC Is Undertaking New Initiatives Concerning Trade Policies Against A Past Track Record of Mixed Results in Attempting to Promote Open Foreign Markets 29

A. The FCC Has Initiated Efforts To Define a U.S. Model 29

B. Past FCC Forays Into Trade Issues Have Met With Mixed Results 35

1. FCC Attempts to Extend Domestic Resale Policies to International Services 36

2. FCC Attempts to Extend Computer II Policies to International Services 38

3. FCC Attempts to Promote Competition in International Services 39

C. The U.S. Has Enjoyed Success Through Coordinated Decisionmaking and Consultation with Foreign Governments 41

Section VI — DIGITAL Offers Some Initial Suggestions for Developing An Information Age Model for Telecommunications and Trade 47

A. Overview 47

B. Principle 1: Trade Policy and Telecommunications Policy Must Be Complementary 48

C. Principle 2: Trade Policy Must Consider Issues in Terms of the Broad Information Age Marketplace Rather than Focusing Unduly Upon Specific Components 50

D. Principle 3: Approaches to Promoting U.S. Access to Foreign Markets Must Be Examined in Terms of Their Compatibility with the Evolution of National Regulatory Policies 51

E. Principle 4: Pursuit of U.S. Objectives Requires a Cost/Benefit Analysis of Short-Term and Long-Term Consequences for Telecommunications and Trade Interests 52

F. Principle 5. Effective Development and Implementation of a Sound Information Age Model Requires a Common Vision of Technology and the Marketplace 53

Section VII — Conclusion 54

U.S. Telecommunications and Trade Policies:

The Need for An Effective Information Age Model

Presented By

DIGITAL Equipment Corporation

DIGITAL EQUIPMENT CORPORATION is pleased to participate in the 1988 Airlie House Conference. In order to assist the Conference in identifying major issues facing the nation, DIGITAL commissioned the preparation of this paper on the necessity for telecommunications and trade policies in the information age. The objective of this paper is to focus the attention of the leading experts and officials assembled by Airlie House upon the pressing need to develop an effective Information Age Model for U.S. telecommunications and trade policies.

DIGITAL believes that the Airlie House Conference presents a particularly timely and opportune occasion to begin the process of formulating a comprehensive approach to impending telecommunications and trade challenges. Congress recently passed legislation that will require in-depth examination of the complexities associated with international telecommunications regulations and trade practices. The Federal Communications Commission has initiated its own broad-ranging foray into trade questions and the policy framework best suited for resolving telecommunications and trade controversies. And the upcoming Presidential election presages changes in Executive Branch leadership responsible for the representation of U.S. interests in both telecommunications and trade. Perhaps most importantly, the Nation's telecommunications network is poised for another great leap forward in offering technological capabilities and opportunities, which will rapidly antiquate past perceptions of the industry and the marketplace.

Against this dynamic backdrop, DIGITAL believes that development of a sound Information Age Model is essential to ensuring that American consumers and businesses enjoy the maximum benefits of telecommunications advances. As a starting

point, decisionmakers must recognize that the telecommunications environment today consists of highly integrated networks comprised of transmission, switching, computing, networking, software and terminal equipment components. In its *Computer III* decisions, the Federal Communications Commission is already modernizing telecommunications policy to reflect technological and marketplace emergence of such intelligent networks. Trade policy is also gradually evolving to accommodate such conditions. However, no consistent, long-term Information Age approach yet exists which serves to harmonize our country's important telecommunications and trade objectives.

As an initial effort to provoke discussion and debate, DIGITAL offers a proposed set of five basic principles that should form the basis for a new telecommunications and trade model. *First*, trade policy and telecommunications policy must be complementary. *Second*, policy issues must be addressed in terms of a broad Information Age marketplace rather than focusing unduly upon narrow service or product components. *Third*, approaches to promoting U.S. access to foreign markets must be examined in terms of their compatibility with the evolution of national regulatory policies. *Fourth*, pursuit of U.S. objectives requires a cost/benefit analysis of the practical short-term and long-term consequences for telecommunications and trade interests. *Finally*, the effective development and implementation of a sound Information Age policy requires a commonly developed industry/government vision of technology and the marketplace.

This paper set forth below is organized in the following fashion. Section I discusses the need for an Information Age Model. Section II examines the technological changes giving rise to increasingly integrated Information Age networks. Section III reviews the FCC's efforts in its *Computer III* decisions to adapt telecommunications policy to facilitate the advent of intelligent networks and advanced integrated services. Section IV shows how trade policy is gradually addressing the technological advances and resulting changes in the marketplace. Section V takes a look at the FCC's current efforts to define an appropriate telecommunications and trade model as well as the Commission's track record in past attempts to influence U.S. access to foreign markets. Section VI discusses threshold principles that might be incorporated into a possible model for U.S. decisionmakers. Section VII concludes by reemphasizing DIGITAL's hope that this paper serves as a catalyst for forward-thinking analysis of a sound U.S. approach for the Information Age. In other words, this is merely an effort to begin the process of defining

U.S. policy rather than a proposed panacea for our nation's telecommunications trade issues.

Section I — There Is A Need for An Effective Information Age Model

A. Technological Advances and Changing Market Conditions Have Made Traditional Models Obsolete

For nearly two decades, telecommunications regulatory policies have attempted to segment the telecommunications marketplace down into distinct, discrete piece parts. As part of an effort to foster competition to the Bell System, the FCC has systematically sought to differentiate between "internal" network services subject to common carrier regulation and "external" services or products utilizing the regulated network. "Internal" functions over time have been narrowed to the provision of basic transmission services and central office switching. "External" unregulated activities have grown to include enhanced services (data processing, protocol conversion, etc.) and numerous equipment offerings (telephone handsets, data sets, modems, key telephone systems, private branch exchanges, etc.). In effect, the FCC has sought to draw a "bright line" between regulated services inside the network and unregulated competitive ventures outside the network.

U.S. trade policies have tended to mirror this fragmented view of the telecommunications marketplace. Traditional trade negotiations have focused on discrete submarkets such as specific types of services and specific types of equipment. Moreover, regulated common carrier services have been handled as their own unique subset for international trade discussions. This sectoral concept of the marketplace thus largely parallels the FCC's traditional approach to telecommunications — albeit for different historical reasons.

Telecommunications and trade policies are now in need of modernization to accommodate the rapidly converging Information Industry marketplace. As discussed in Section II below, the telecommunications network is witnessing a dramatic irreversible blurring of previously perceived boundary lines. "Internal" network characteristics and architecture are evolving toward "intelligent" networks incorporating computing functions, storage and retrieval, networking software and CPE-type functions.

At the same time, external services and products are able to assume switching, call management and other functions previously reserved for the internal network.

In effect, we are seeing the first stage implementation of the "Geodesic Network" envisioned by Dr. Peter Huber. These changed conditions have already led to profound shifts in telecommunications regulatory policy. The FCC's *Computer III* decisions have sought to ensure a favorable framework for maximizing benefits from such technological and marketplace developments. Trade policies are also beginning to adapt to such changes. However, to date, there is no consistent long-term vision of U.S. objectives which melds telecommunications and trade policies. Clearly, an Information Age model for addressing important issues and problems arising in the telecommunications and trade context is sorely needed.

B. The Absence of an Information Age Model Creates Serious Risks of Inconsistent and Counterproductive U.S. Actions

Just as the telecommunications industry has been traditionally fragmented for policy purposes, so too have U.S. telecommunications interests been viewed in isolation from U.S. trade interests. In the past, telecommunications policy-makers have tended to view the industry from the perspective of advancing benefits for domestic users of the network. Trade officials, in contrast, have tended to focus on means to secure foreign market access for U.S. suppliers of services and equipment. Neither perspective, however, has allowed for a full appreciation of the inevitable tensions between such different concerns or the ultimate impact of isolated actions upon the broad range of consumer and commercial interests in the Information Age.

Ironically, the FCC itself has recently brought these concerns and problems into focus by initiating an examination of how its telecommunications licensing and certification processes should be used to promote *trade* interests. In response to charges U.S. carriers were being disadvantaged by foreign equipment companies in overseas markets, the Commission embarked upon its own inquiry into trade questions. Indeed, the FCC is examining the principles which should go into a model for telecommunications and trade policies. This initiative has generated serious concerns because the undertaking has been pursued outside traditional trade channels. Moreover, past FCC efforts in the "trade" arena have shown mixed results.

Even as the FCC has been pursuing the optimum model, Congress has been drafting trade legislation. The new trade law[1] does not attempt to define any comprehensive analytical approach for the telecommunications industry. However, the law does address telecommunications goods and services and also instructs the Commerce Department to conduct an in-depth study and report to Congress on telecommunications trade conditions. This study provides yet another flash point for future actions -- actions yet unguided by any commonly understood interests and goals.

The FCC and Congressional actions, of course, are all occurring in the middle of a Presidential election year. The impact of the election upon U.S. policies in this arena remains as unclear as the likely election results. However, trends in key telecommunications and trade policies can be predicted with certainty. These changes will inevitably present important opportunities to reshape and redirect U.S. policies for the Information Age. Thus, the need for an effective U.S. model is not only pressing but timely.

Section II — Technological Advances Have Led to An Increasingly Integrated Information Age Marketplace

Twenty years ago, the telecommunications marketplace was essentially the exclusive province of the Bell System as an end-to-end provider of services and equipment. In a series of decisions, the FCC began chipping away at that monopoly by declaring specific aspects of the industry to be competitive, non-carrier offerings. In pursuing these telecommunications goals, the Commission assumed that the public telephone network "had a simple Euclidean structure, with an inside and an outside."[2]

From the 1970s until very recently, this view of the network as having internal and external submarkets has been a central guiding principle. In opening up the network to customer premises equipment ("CPE") competition, the FCC drew a boundary line between regulated network services and unregulated equipment essentially attached to

---

1 Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, 102 Stat. 1107 (1988).

2 P. Huber, The Geodesic Network: 1987 Report on Competition in the Telephone Industry, at 1.6 [hereinafter "Huber Report"].

the ends of transmission lines.[3] Similarly, in its *Computer II* decisions, the Commission sought to draw a "bright line" between basic transmission services and unregulated enhanced services. In effect, the telecommunications ground rules divided the marketplace into (1) internal network functions such as transmission, switching and call processing; and, (2) external functions such as CPE, enhanced services, software and products utilizing transmission services generally.

At the time, this dichotomy was not illogical. Network transmission and switching services were designed for analog voice communications. Computer-based services and products operated in a different, digital world. As a result, use of the network for nascent Information Age applications required special modems, connections and line conditioning. These circumstances inherently reinforced the view of the industry as falling into separate sectors.

As discussed below, this simplistic view of the world no longer has vitality. Technological advances have ever increasingly led to an integrated Information Age marketplace. These advances include several basic elements. *First*, network transmission is moving from an analog, narrow bandwidth "voice" environment to a digital, broadband "data" capability. As a result, voice and data traffic become largely indistinguishable. *Second*, network switching has also evolved from analog to digital with new central office switches essentially functioning as large computers with enormous computing potential. *Third*, network architecture is evolving toward intelligent networks incorporating sophisticated data processing and information services previously only used on an external basis by CPE and enhanced service providers. *Fourth*, local and wide-area networks, computers, PBXs and application software now perform many functions previously only available as part of the public network. *Finally*, the network of the future is emerging as an open, intelligent highway in which external versus internal boundary lines will no longer be discernible nor desirable to end users.

---

3 *See, e.g.*, Second Computer Inquiry, 77 F.C.C.2d 384 (1980).

A. The Network of the 1960s Was Profoundly Affected by the Advent of the Computer Age

Under traditional regulatory thinking, the telephone network has two basic internal functions: switching and transmission. Up to the early to mid-1960s, switching was performed through mechanical or electromechanical equipment — far more efficient than live operators,[4] but still, at its best, incapable of performing information processing functions. Transmission generally utilized copper lines, although microwave technology had recently blossomed, offering an alternative in some circumstances. The network switching and transmission functions were understandably designed to accommodate voice traffic moving through the network on an analog basis.

External to this voice network, the world was witnessing a remarkable event — the advent of the Computer Age. In 1961, there were 10,000 computers in the United States; by 1966, this number had tripled.[5] These early computers were so-called "mainframes" — large, isolated machines, readily accessible neither to users nor to each other. Their functions (primarily data processing and storage of information) were entirely independent of the telephone network. Aside from computer-based data processing and information retrieval, there were no other "information services" of any note.

By the mid-1960s, it was evident that communications technology could be utilized to make computer use more efficient. Data processors no longer were required to carry cards to the mainframe and wait, but could now transmit information from a remote terminal over a private line. As the FCC explained in 1966:

> The modern-day electronic computer is capable of being programmed to furnish a wide variety of services, including

---

4 These switches could handle approximately 115,000 calls per hour. In comparison, modern digital switches such as the DMS100 can switch up to 330,000 calls per hour. Bethesda Research Institute, "Regulatory Systems for the 1990s: A Comparative Analysis of Price Caps and Rate of Return Regulation," at 41 (July, 1988) [hereinafter "BRI Study"].

5 Federal Communications Commission, Report on Domestic Telecommunications Policies (September 27, 1976), at 15 [hereinafter "FCC Domestic Policies Report"].

The growth in computers has, of course, continued at a staggering pace. In 1981, there were 240,000 home computers; by the end of 1985, there were 12 million (Huber Report, at 1.11); and it is estimated that by the end of 1988, there will be more than 20 million home computers -- a penetration level of more than 22 percent (NTIA Information Services Report (August 1988), at 27 [hereinafter "NTIA Report"]. Use of computers in the office has expanded to a similar extent. NTIA estimates that there were 4.3 million microcomputers in use in 1982, and 27.7 million in 1986. *Id.*

> the processing of all kinds of data and the gathering, storage, forwarding, and retrieval of information . . .. With its huge capacity and versatility, the computer is capable of providing its services to a multiplicity of users at locations remote to the computer. Effective use of the computer is therefore becoming increasingly dependent upon communications common carrier facilities and service by which the computers and the user are given instantaneous access to each other.[6]

As computers began to make expanded use of communications facilities, it quickly became apparent that the existing telephone network — which was optimized for voice communications — had serious limitations for data transmission. Among other problems, the analog voice network required the use of costly modems to support digitally transmitted data, could not accommodate full duplex operation, and yielded an excessive bit error rate. Yet, as the FCC noted over 10 years ago, "the technological revolution [computers] that produced the demand for specialized communications also produced many of the solutions . . .. The technology also promised to revolutionize non-specialized aspects of the network, especially switching."[7]

B. Technological Advances Have Greatly Expanded Internal Network Telecommunications Capabilities

From the mid-1960s through the present, there have been startling advances in network technology and capabilities. Transmission facilities have moved toward digital, broadband characteristics conducive to handling data transmission. Switching facilities have also moved toward a digital environment, with the resulting ability not only to handle data traffic generated by users, but also to incorporate advanced data processing features and services as added network offerings.

1 Advances in Transmission Facilities

Developments in transmission technology have occurred in two principal areas: the packaging of the transmitted information and the medium of transmission. As a result

---

6 Regulatory and Policy Problems Presented by the Interdependence of Computer and Communications Services and Facilities, Docket 16979, 7 F.C.C.2d 11 (1966).

7 FCC Domestic Policies Report, at 18.

of these developments, network transmission now incorporates data processing functions that once were considered only available as non-network, "enhanced" capabilities.

a. Developments in Packaging of Transmitted Information

Two developments in the way data is transmitted — packet-switching and protocol processing — have permitted in enhanced functions to be integrated into network transmission. Packet-switching increases the efficiency of data transmission by maximizing the utilization of transmission capacity. Data communications, unlike voice communications, are "bursty" — there are brief periods of intense utilization followed by relatively lengthy periods of silence. Packet-switching technology creates discrete, uniform bundles of data, each of which contains bits identifying its ultimate destination and its place within the transmitted bit stream. Packets may be routed over any of a multitude of different transmission paths, then stored (for a very short period) pending the arrival of other packets, and finally reassembled at the destination.[8]

Protocol processing refers to changes in the code, format, or protocol of transmitted information.[9] Simply put, protocol processing allows disparate computers to communicate with each other. For example, personal computers generally transmit on an "asynchronous" protocol.[10] In contrast, packet-switched networks (and, frequently, remote host computers) transmit under the "X.25" protocol. In order for a PC to communicate over a packet-switched network, its transmission must be converted from asynchronous to X.25.[11] (Transmissions between packet networks also requires protocol conversions, since some operate on an X.75 protocol and there are several variations of X.25.)

---

8 Packet-switching technology was developed in the early 1970s, but deployed on a widespread basis only by external service providers such as Value Added Networks ("VANs"). Over the last several years, however, local exchange carriers have increasingly incorporated packet-switching capabilities into their networks.

9 *See* 47 C.F.R. § 64.702(a) (1987).

10 More and more, however, personal computers are incorporating sophisticated data communications capabilities.

11 *See* Asynchronous/X.25 Waiver Order, 100 F.C.C.2d 1057 (1985). Similarly, information may be coded in different ways or transmitted at different speeds, and if different machines operate under different codes or at different speeds, code and speed conversions are necessary to enable intercommunication

In the 1970s, VANs "added value" to common carrier transmission services by performing these protocol processing services for end users. In addition, private branch exchanges ("PBXs") and other forms of CPE regularly offer protocol processing capabilities. Only within the last three years, however, have local exchange carriers integrated some protocol processing services into their transmission offerings.[12] Moreover, transmission through the telephone network now involves storage and processing functions that once were considered purely external.

b. Developments in Transmission Media

The overriding change in transmission media since 1965 has been the deployment of digital transmission lines — most notably, optical fiber. In the 1970s, common carriers (led by the new specialized common carriers) introduced digital transmission capabilities in order to eliminate the need for modems and increase the efficiency of data transmission.[13] These lines (which remain viable offerings today) generally had relatively narrow bandwidths, and consequently supported data transmission at low to medium speed.

In 1977, the first commercial fiber optics system was installed, and transmission technology has improved rapidly ever since. This early system operated at a then-staggering 45 megabits per second, but required repeaters at four mile intervals.[14] By 1985, over 700,000 miles of fiber had been put in place, and by the end of 1987, this number had more than doubled.[15] Moreover, transmission speeds have increased dramatically — many fiber systems routinely operate at more than one gigabit per second (Gbps),[16] and experimental systems now support bit rates greater than two Gbps.[17] In addition,

---

12 Doing so necessitated waivers of the FCC's *Computer II* rules, which — reflecting the "line" between network and external functions — required the BOCs to offer protocol processing and other "enhanced" services through a separate subsidiary.

13 FCC Domestic Policies Report, at 85.

14 J.H. Green, *The Dow Jones-Irwin Handbook of Telecommunications* 419 (1986).

15 BRI Report, at 29 and Figure 21.

16 *Id.* at 38.

17 J.H. Green, *supra*, at 420. Some analysts predict that bit rates may double each year into the next century. *See* BRI Report, at 39.

repeater spacing now exceeds 40 kilometers.[18] These quantum leaps in transmission technology greatly expand the network's ability to support information services and networked computer systems.

2 *Advances in Network Switching Facilities*

Over the past two decades, network switching, even more dramatically than network transmission, has integrated storage and data processing capabilities that traditionally have been thought of as belonging outside the network. In particular, computer technology has been incorporated into network switches and adjunct processors, vastly increasing their functionality and efficiency and capable of supporting a multitude of network-based information services.

The first stored program control ("SPC") central office (a type of switch based on computer processing technology) commenced operation in 1965, and these switches — such as AT&T's 5ESS — have now replaced electromechanical equipment at more than half of all local central offices.[19] In a SPC switch, call processing functions are performed by a central processing unit (a computer) under direction of a generic program. The switch can offer new features, such as call forwarding, speed calling, and call conferencing, simply by updating this program. These features can also be restricted to particular users through software changes.[20]

In providing such features, these switching systems employ storage and data processing. For example, in speed calling, a subscriber provides the central office switch with a set of one- or two-digit numbers that correspond to the subscriber's frequently called numbers. Upon dialing the abbreviated number, the switch looks up the corresponding network number, performs the translation, and routes the call.

---

18 *Id.* at 38.

19 *Id.*, Table 10.

20 In addition, SPC switches, unlike their electromechanical predecessors, can collect statistical and billing information and can detect and diagnose faults.

For a discussion of the technology and capabilities of SPC switches, *see generally*, J.H. Green, *supra*, at 246-47, 267-71.

The Bell Operating Companies ("BOCs") currently are developing additional applications for number translations and other database capabilities. In providing "BOC 800" services, the local exchange carriers will store in a remote database number translation tables and subscribers' preferences for routing calls to particular interexchange carriers or particular geographical locations based on the time of day. When a customer of the 800 service subscriber dials the subscriber's 800 number, the central office switch will query the database to determine the subscriber's specific routing instructions and perform the appropriate number translation. This information will be sent back to the switch, which will route the customer's call through the network accordingly.[21]

Finally, modern switching systems, through the use of adjunct processors, can provide many network-based information services. For example, voice messaging and electronic mail services can be incorporated into the network by interconnecting an appropriate processor unit to the central office switch.[22]

3 *The Advent of Intelligent Networks*

New intelligent networks now being implemented carry the integration of computer technology several steps farther. For example, Bellcore — the central service organization of the BOCs — currently is developing a switching, information retrieval, and routing architecture that relies on a system of computers and a separate channel for transmission of signaling information. Under this system, intelligent switches ("Service Switching Points") will receive calls and, similarly to BOC 800, identify requests for various intelligent network services. These switches will send queries regarding, for example, authorization codes, through a fast packet switch called a "Signal Transfer Point" to the "Service Control Point," or "SCP." The SCP is a "transaction-oriented computer data base system that contains the information necessary to sequence and

---

21 Other capabilities supported by more advanced database technology include credit verification and enhanced 911 services.

22 *See, e.g.*, Huber Report, at 1.10 n.10.

activate those network capabilities required to provide a particular service," and also maintains a record of the services to which a customer has subscribed.[23]

In short, as Professor Huber has noted, "the 'basic' network is already permeated with electronic 'information services'," [24] and this integration will only accelerate. "Sooner or later, one way or another, storage, retrieval, and the low-level formatting functions essential to any efficient distribution system will be incorporated fully in the public network . . .." [25] Put another way, as a result of these technological advances, the network has become "a giant computer," [26] capable of performing the functions and features previously associated only with external hardware and software.

C. Technological Advances in "External" Computing Systems and Applications Allow Performance of Many Functions Previously Offered Only by the Network

From the late 1970s to the present, the sophistication and functionality of external telecommunications-related equipment and software has increased markedly. Just as the telephone network has incorporated data processing and storage functions previously available only through external equipment and software, so too have computing systems and applications come to perform many functions once offered only by the network. Indeed, computing systems and applications now compete with network capabilities to such an extent that Professor Huber has stated that "CPE and LEC services are now substitutes more often than they are complements." [27]

For example, the first private branch exchanges ("PBXs"), which were developed in the 1970s, were essentially small central office switches, used almost exclusively for voice communications. They competed (and still compete) directly against telco-provided "Centrex" services. Indeed, private buyers now purchase approximately 40 percent of all

---

23 Huber Report, Figure IS.12.

24 *Id.* at 1.28.

25 *Id.* at 1.30.

26 Economics and Technology, Inc., Customer Benefits Under Price Caps Regulation: Rethinking the FCC's May 1988 Proposal, at 19 (July 26, 1988).

27 Huber Report, at 1.14.

switches, and PBXs now switch 30 million lines — a 100 percent increase from 1981. Moreover, PBX-switched lines are being added to the network at the same rate as new telephone company lines.[28]

By the mid-1980s, PBXs also began to employ SPC technology, and were used more and more for data transmission. The latest generation of PBXs — akin to the intelligent network architectures described above — employs a modular architecture, with distributed processing. These PBXs support a wide range of features, including voice/data integration, code, speed, and protocol conversions, least cost routing, station message detail recording, distinctive ringing, display of calling number, restricted access to long distance lines, and voice messaging.[29]

In addition, many companies choose to construct their own private networks for long distance transmission. Private buyers now account for 20 percent of all purchases of microwave transmission equipment and 20 percent of all purchases of fiber optic cable and electronics.[30] And at the local level, many users employ PBXs or local area networks ("LANs") to communicate within a single building and wide-area networks ("WANs") over larger geographic regions.

* * * * *

In short, it has become increasingly difficult to draw lines between the network and external functions. Advancements in network transmission and switching, and the incorporation of computer technology into telecommunications, have rendered the network capable of performing data processing and storage and retrieval functions previously available only through external equipment and service providers. Concomitantly, CPE now provides switching and transmission functions that once were the sole province of the telephone company. Quite clearly, the traditional Euclidean view of the

---

28 *Id.*, at 1.11.

29 Moreover, modern CPE provides many other network-type functions. For example, many companies use CPE to perform multiplexing functions, and some equipment enables users "to pre-process their traffic in an advantageous manner (*e.g.*, integrating voice and data or compressing information) before giving it to a service provider." NTIA Report at 47-48.

30 Huber Report, at 1.11.

network no longer has vitality. The divisions underlying decades of telecommunications policy will shortly disappear, as the network of the future becomes a reality.

D. The Information Age Network of the Future Will Be An Open, Intelligent Transmission Highway

DIGITAL sees the network of the future — the Information Age Network — is emerging as an open, intelligent highway for the transmission of information. Any distinctions between external and internal functions are inexorably being eroded. The network will perform highly sophisticated data processing, storage and retrieval, and advanced information services, along with traditional transmission and switching functions. It will interconnect at countless nodes (through standard, non-proprietary interfaces) with private equipment and networks that offer all of these same functions.

Users will custom-design services using elements provided by a multitude of both regulated and unregulated vendors. Ubiquitous and open access to network intelligence will enable residential and small business subscribers efficiently to use a wide variety of Information Age services. Moreover, with the full implementation of Open Network Architecture discussed in Section III below, non-telephone company manufacturers and information service providers also will be able to design products and services that incorporate as little or as much intelligence as is desired.

The technology needed to support this beneficial integration is developing rapidly. Sound government policies are imperative, however, to ensure that the implementation of the new Network is not unduly restricted or delayed, and that the resulting information highway is truly open. The next Section of this paper discusses recent rule revisions instituted by the Federal Communications Commission that attempt to address these changing technological realities.

Section III — Telecommunications Policy Is Evolving to Reflect Changing Technological Realities

As noted earlier, the FCC's *Computer II* decisions historically drew a line between internal network functions and external CPE and information services. In those decisions, the Commission required that all CPE and enhanced services be detariffed, and held that AT&T and (after divestiture) the Bell Operating Companies could provide

external equipment and enhanced services only through a structurally separated subsidiary.[31]

In so holding, the Commission recognized that computer technology was being increasingly integrated into the network:

> As the market applications of computer technology increase, communications capacity has become the necessary link allowing the technology to function more efficiently and more productively. Transmission networks have benefitted from some of the productive breakthroughs which this relatively new field has made possible. As a result, the computer industry and the communications industry are becoming more and more interwoven. We believe, and the record shows, that this trend will become even more pronounced in the future.[32]

However, the agency believed that its distinction between basic network services and enhanced information services, as implemented in the separate subsidiary requirement, was "clear and . . . sustainable" and would encourage the continued integration of new technology into the network.[33]

A. Computer III *Recognized the Changing Technology and Marketplace*

In recent years, circumstances — and the FCC's reaction thereto — have changed. As Professor Huber notes, *Computer II* "took a firm stand against the integration of information services into the network, at a time when there was very little to integrate and competition in providing these services outside the network was already quite robust."[34] He continues:

> Until recent years it hardly mattered. But it does now. The major telecommunications challenge in the next decade is the seamless interconnection of the intelligent nodes already in

---

31 Second Computer Inquiry, 77 F.C.C.2d 384, *recon.* 84 F.C.C.2d 50 (1980), *aff'd sub nom.* Computer and Communications Indus. Ass'n v. FCC, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied* 461 U.S. 938 (1983).

32 Second Computer Inquiry, 77 F.C.C.2d at 422.

33 *Id.* at 423.

34 Huber Report, at 1.27.

> place [in external equipment] . . .. The nodes, and the devices they control, can all be made to run more productively, or cheaply, or safely, if they can be successfully linked to other, remote, intelligent machines and people. But the networking challenge is altogether new. An altogether new network will certainly be required.[35]

The FCC's *Computer III*[36] proceeding was a response to this new technological challenge. The Commission noted that its delineation of basic and enhanced services, and particularly the structural separation requirement, had come to pose some serious problems.

First, the agency explained that the *Computer II* rules do not permit "facilities that create or implement 'enhanced services' . . . to be integrated with facilities for common carrier communications." As a result, the Commission found that "there has been a denial to the public of efficient services that can be created through such integration and their benefits."[37]

In addition, the FCC stated that "the definition of 'enhanced service' itself has been ambiguous."[38] In short, the line between basic and enhanced services — particularly when used to determine whether structural separation should apply — was rapidly becoming unworkable.

After receiving thousands of pages of public comment on its proposals, the Commission adopted a new regulatory structure designed to permit the integration of enhanced functionalities in the network under procompetitive conditions. The agency replaced structural separation with a set of nonstructural safeguards[39] and a

---

35 *Id.* at 1.27-1.28.

36 Third Computer Inquiry, 104 F.C.C.2d 958 (1986), *recon.* 2 F.C.C. Rcd. 3055 (1987), *appeal docketed sub nom.* California v. FCC, No. 87-7230 (9th Cir. filed May 28, 1987).

37 Third Computer Inquiry, FCC 85-397, ¶ 6 (August 16, 1985) (Notice of Proposed Rulemaking).

38 *Id.*, ¶ 10. Thus, the agency stated that speed changes within the network are considered basic network functions, even though they could be viewed as a form of protocol processing, which would counsel unregulated treatment.

39 These safeguards address cost allocations, protection of customer proprietary network information, disclosure of certain technical information, and nondiscriminatory installation and maintenance of network service.

requirement for short-term (Comparably Efficient Interconnection, or "CEI") and long-term (Open Network Architecture, or "ONA") changes in network architecture. These new requirements are reviewed briefly below.

Before offering an enhanced service on an unseparated basis, AT&T and the BOCs must file a CEI plan for that service. Basically, the CEI plan is meant to ensure that all enhanced service providers — whether or not affiliated with the telephone company — will have equal access to underlying basic service elements used in the provision of the enhanced service. To this end, the CEI plan must demonstrate that the carrier will comply with several requirements:

- *CEI Availability*. CEI must be fully operational and available on the date that the carrier offers the corresponding enhanced service to the public. In addition, competing ESPs must have an opportunity to test the CEI offering before it is implemented.

- *Equal Access*. In general, the basic service functions utilized by a carrier-provided enhanced service must be available to others on an unbundled basis, with technical specifications, functional capabilities, and other quality and operational characteristics, such as installation and maintenance times, equal to those provided to the carrier's enhanced services.[40]

- *Resale*. A carrier's enhanced service operation must take the basic services used in its offerings at unbundled, tariffed rates.

- *Minimization of Transport Costs*. Carriers must demonstrate what steps, such as voluntary collocation or loop or trunk multiplexing, they will take to minimize transport costs for competitors. Alternatively, they can meet this requirement by charging their own enhanced service operation and their competitors equal amounts for transport.[41]

---

40 In this respect, the rules set forth detailed technical and functional parameters. For example, with regard to unbundling, the Commission requires that any basic service elements underlying the carrier's enhanced service offering — such as digital transmission, supervisory signalling, and a stutter dial tone — must be unbundled and associated with a specific rate element in the CEI tariff.

41 The *Computer III* decisions also impose requirements regarding the pricing of distance sensitive transmission, interconnection, traffic concentration, and network usage.

AT&T and a number of the BOCs have filed CEI plans for several enhanced services. To date, AT&T has received approval for two services — Transaction Services and Codec Conversion Service — and several BOCs have each been permitted to provide certain voice messaging and gateway services on an unseparated basis.

ONA, in contrast, is a long-term change in network architecture that would extend to enhanced services generally the safeguards satisfied for particular enhanced services by CEI. Upon implementation of ONA, AT&T and the BOCs will be permitted to offer any enhanced service on an unseparated basis without the need for CEI plans.

ONA seeks to open the network in a way that is "self-enforcing" in controlling discrimination. To this end, the Commission has required AT&T and the BOCs to file ONA plans setting forth a set of initial Basic Service Elements ("BSEs") — disaggregated network capabilities useful in providing a wide range of enhanced services — that will be generally available within one year after plan approval. In addition, the plans must demonstrate that the carrier will comply with all of the CEI requirements, and that the carrier's enhanced services operation will take the BSEs at the same rates, terms, and conditions as unaffiliated ESPs.

In preparing to file their plans, each of the carriers, through national and regional ONA forums and discussions with individual industry segments, explored the ONA needs of independent enhanced service providers. These ESPs requested 118 ONA capabilities on a national level, and each region reported additional requests. In addition, the carriers and the ESPs established the Information Industry Liaison Committee ("IILC"), to provide a continuing forum for ONA planning.

The carriers filed their ONA plans by February 1, 1988, and the FCC received public comment on the plans in April and May. Major issues briefed to the Commission include the appropriate degree of unbundling, the need for FCC oversight of the ONA development process, the appropriateness of cost-based pricing, and the need for greater national consistency in the ONA offerings. The Commission is currently considering these issues.

B. ONA Will Facilitate the Advent of the Information Age Network

The ongoing ONA planning process is intended to lead to equal access for competitors and unbundling of valuable network capabilities. As is explained below, once ONA is implemented, it will permit full integration of enhanced service features into the network and should facilitate the rapid introduction of new Information Age services and capabilities.

Initially, it should be noted that ONA is inextricably intertwined with the deployment of increased intelligence in the network. The intelligent networks of the future will rely increasingly on distributed functionality, with adjunct processors and "feature nodes" enhancing basic switching. Thus, Professor Huber has noted that "[n]etwork intelligence is moving away from the central-office switch even within the central office itself. In an age where technology readily permits hand offs of traffic and control, sound engineering design dictates an increasingly modular design for switches and their peripherals."[42]

This distributed functionality and intelligence is the cornerstone of ONA. Currently, with network intelligence frequently resident in the switch or closely related equipment, equal access is technically difficult: the telephone company's enhanced service operation has an inherent advantage in interconnection. With the advent of new, intelligent network architecture such as those discussed in the prior Section of this paper, however, equal access becomes a fundamental aspect of the network design. In a "feature node" architecture, for example, network capabilities are available to all service providers, whether or not affiliated with the telephone company, on a nondiscriminatory basis.

Once ONA has been implemented, telephone companies, unaffiliated ESPs, consumers, and the nation will all benefit tremendously. As Professor Huber notes, ONA will allow "independent providers to assemble their own, customized package of services."[43] There will no longer be a line between the network and external functions

---

42 Huber Report, at 1.10 n.10.

43 *Id.*, at 1.5.

and capabilities, as both telephone companies and non-affiliated service providers are able to craft unique and valuable information services:

> ONA will bring about a quantum improvement in the flexibility of [Information Service Provider ("ISP")] access to LEC switches, at least as important in ISP markets as the introduction of equal access has been in the market for inter-exchange services. ONA should permit much more rapid and efficient introduction of a wide range of information services, including database inquiry/response systems, videotext applications, 911 services, private virtual networks, voice storage services, and CLASS (Custom Local Area Signaling Services) features that permit enhanced call management.[44]

As a result, competition in the provision of enhanced services will be robust, creating strong incentives for innovation and increased productivity. The capabilities of the network will be exploited to the fullest possible extent, yielding an intelligent, open transmission highway. And most important, no segment of the marketplace will be without access to the Information Age: efficiency-enhancing information services will be ubiquitously and economically available.

Section IV — Telecommunications Trade Policy Is Evolving to Address U.S. Concerns

In parallel with (and often stemming from) the above developments were growing concerns regarding the United States' international trade position in information technologies. As the U.S. regulatory environment became more open, foreign concerns were offered increasing opportunities to gain access to the U.S. market, leading to growing interest in telecommunications trade.

A. Telecommunications Trade Has Become An Important Priority for U.S. Trade Policy

Historically, the United States has followed a mixed approach to international trade matters, relying mostly on *laissez faire* with occasional forays into reciprocity both in general and in the context of telecommunications. And, prior to the breakup of the old

---

44 *Id.* at 6.24.

Bell System, telecommunications trade was not a major concern: the volume of trade overall was not especially large (since the Bell System procured almost exclusively from its own manufacturing arm, Western Electric), and the United States consistently ran a surplus.[45] With the AT&T divestiture, however, all of that changed. Within a few years, U.S. markets experienced greater penetration by foreign equipment,[46] with American companies facing unprecedented competition in the markets for handsets, key systems, and PBXs and threatened competition for the Central Office switch market.[47]

Much of this competition came from Japan,[48] a fact which raised concerns about reciprocity in trade relations between the United States and Japan. Increased scrutiny on Japan revealed that the major Japanese consumer of telecommunications products, Nippon Telegraph & Telephone (NTT) traditionally procured virtually all of its equipment from a small number of favored Japanese suppliers, leaving other companies (such as U.S. producers) without a market.[49] Since 1978, the United States had carried on efforts to open the Japanese market for the benefit of American companies;[50] these efforts received steadily higher priority as the imbalance in U.S./Japan telecommunications trade grew.[51]

One outcome of those efforts was the 1980 bilateral agreement on procurement between the United States and Japan.[52] That agreement called for nondiscriminatory procurement by NTT, and NTT did put in place procedures to implement the agreement.

---

45 *See* S. Rep. No. 71, 100th Cong., 1st Sess. 216 (1987).

46 *See* NTIA Trade Report: Assessing the Effects of Changing the AT&T Antitrust Consent Decree (1987).

47 *See* "Breakup Seen Opening Up U.S. Market to Japanese," *Computerworld*, Mar. 12, 1984.

48 *Id.* at 217.

49 General Accounting Office, U.S.-Japan Trade: Interim Report on Sector-Specific Agreements, at 6 (1987); Howell, Benz & Wolff, *International Competition in Information Technologies: Foreign Government Intervention and the U.S. Response*, 11 Stanford J. Int'l L. 215, 231 (1986).

50 Howell, Benz & Wolff, *supra*, at 231.

51 *Id.*

52 Agreement on Trade: Procurement in Telecomm., Jan. 30, 1984, United States-Japan, 32 U.S.T. 4496, T.I.A.S. No. 9961. *See also* General Accounting Office, Assessment of Bilateral Telecommunications Agreements With Japan (1983) (discussing agreement).

Actual purchases, however, showed no substantial change, with NTT purchases of foreign equipment remaining at a very small percentage of total annual procurement in the years following.[53] According to U.S. producers, the changes in formal regulations brought about by the NTT agreement were not matched by changes in the behavior of NTT bureaucrats. Problems were worsened by the Japanese decision to begin privatizing NTT; many procedures and standards proposed for the new private entity were seen by U.S. critics as reducing the already slim opportunities for sales in Japan even further.[54]

Some U.S. legislators, led by Senator John Danforth, responded by introducing legislation[55] that would have imposed stiff penalties on countries that failed to open their telecommunications markets and calling for negotiations aimed at securing improved access to Japanese markets. Those negotiations, designated MOSS (for Market-Opening Sector Specific) had as their first priority opening of the Japanese markets for telecommunications terminal equipment and U.S. network services. When the talks showed little success, the Congressional criticism intensified, with threats of import restrictions and increased duties on Japanese telecommunications products. Eventually, negotiations led to modifications to the proposed privatization legislation aimed at avoiding new barriers to U.S. sales,[56] a move that was widely welcomed in the United States.[57]

While it is fair to say that U.S. interest in telecommunications trade began with a focus on Japan, attention quickly turned to other areas of the world. In an effort to deflect the mandatory character of the Danforth bill, the Administration launched a series of

---

53 *See* S. Rep. No. 71, 100th Cong., 1st Sess. 217 (1987); Congressional Quarterly Almanac, 99th Cong., 1st Sess. 262 (1986). Estimates derived from data obtained from the U.S. Department of Commerce, U.S. International Trade Commission, NTT and press reports indicate that U.S. sales as a share to total NTT procurement increased from 0.56% in 1981 to a high of 6.04% in 1984, and subsequently declined to less than 4%.

54 General Accounting Office, U.S.-Japan Trade: Evaluation of the MOSS Talks at 17-18 (1988) [hereinafter "GAO Report"]; Howell, Benz & Wolff, *supra*, at 233-34.

55 *See, e.g.*, S.2618, 98th Cong. 2d Sess. Cong. Rec. S 1540 (daily ed., May 1, 1984) (legislation introduced by Sen. Danforth which could have increased tariffs on telecommunications products to "Column 2" levels for countries refusing to open their markets to U.S. companies).

56 GAO Report at 17-18.

57 *See* Howell, Benz & Wolff, *supra*, at 235-37.

bilateral negotiating initiatives aimed at opening foreign markets for U.S. equipment and increasingly for U.S. telecommunications.[58] Italy and the European Community were each the subject of an individual bilateral discussion.[59]

To the extent these efforts were aimed at preventing passage of the Danforth bill, they must be judged a failure. A later version of this legislation embodied in the "Telecommunications Trade Act of 1988" was enacted as part of the Omnibus Trade and Competitiveness Act of 1988.[60] But, perhaps more importantly, the ongoing negotiating initiatives served to channel the political pressure toward constructive ends. Furthermore, private sector interests became heavily involved in work on both the negotiations and the legislation, which in turn helped to gain Congressional approval of a series of modifications to the law. These changes help to define U.S. objectives and priorities and allow a measure of Presidential discretion in the use of remedial measures.[61]

To date, the record of U.S. telecommunications trade efforts can best be described as mixed. But if there is any lesson to learn from the experience of the last ten years, it is the need to develop an overall strategy aimed at promoting the United States' position in information technologies.

B. Trade Negotiations and U.S. Trade Law Have Focused on Discrete Components

To date, U.S. trade Policy has lagged behind the increasing integration of computer and communications technologies and has failed to integrate the perspectives of these two separate, but converging industries. This has led to the development of trade policies and objectives that focus narrowly on short-term, product-specific approaches and do not take into account their implications and overall approaches for a broader range of products and services. The importance of an overall strategy is especially important when one examines the telecommunications trade issue from the perspective of U.S. computer

---

58 *See* United States Trade Representative, National Trade Estimate: 1988 Report On Foreign Trade Barriers.

59 *Id.* at 93, 142. *See* Howell, Bena & Wolff, *supra*, at 235-40.

60 Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, §§ 1371-1382, 102 Stat. 1107 (1988).

61 *See* Holmer and Bello, The 1988 Trade Bill: Is It Protectionist? (Sept. 23, 1988).

companies. A brief anecdote will illustrate the problem. When the Danforth legislation was originally introduced, it called for withdrawing U.S. tariff concessions on all telecommunications products if other countries failed to provide equivalent access.[62] Included in the bill's definition of telecommunications equipment were any computer systems or components "designed for connection to telegraphic or telephonic" systems.[63]

The impact of such a measure would have been far reaching. Integration and the miracles of semiconductor technology have allowed networking capabilities to be designed into computer hardware down to the simplest PC. Yet the threat of retaliatory actions against these products could easily have caused other countries to respond in kind against U.S. computer makers who frequently enjoy a highly favorable position in the local market. Consequently, computer companies lobbied very hard to delete any reference to tariff items that covered computer equipment, and these efforts were ultimately successful.

The elimination of this direct threat to computer interests has not, however, served to resolve the larger dilemma posed by telecommunications trade initiatives. The technological merger of communications and data processing means that the bright line that has existed in our tariff schedule will increasingly be blurred. Under the new Harmonized System of tariff classification, the U.S. Customs Service will have to wrestle with distinguishing telephony and telegraph products from one another and from automatic data processing (ADP) products when, in fact, technological factors do not permit easy distinctions among these categories.[64]

In a broader sense, the fates of our computer and telecommunications industries are already intertwined. Any time the United States threatens actions against other countries for failure to open their telecommunications markets, the pressure grows in those countries to restrict U.S. sales of computers and other high-technology products.

---

62 S. 2618, *supra*.

63 *See* S.2618, § 202(a)(1)(A)-(C), (a)(2)(A), (a)(3)(G), (a)(3)(J) (amending descriptions in various tariff classifications).

64 The U.S. Customs Service is considering whether to create new tariff language in the Harmonized System that could merge current ADP, telephone and telegraphy provisions.

This interrelationship is all too often obscured by the perspective of U.S. trade officials which has traditionally been dominated by product specific concerns.

Tariff negotiations, for example, are inherently conducted on a product-by-product basis, as any reading of the Tariff Schedules of the United States will reveal.[65] Even where overall formulas are involved, the item-by-item nature of the tariff schedules tends to promote a narrow and overly-focused approach that centers on a few specific items. The result is that progress on a few items is often bought at the price of backsliding on others -- and often the items on which progress is made are not those of greatest importance to opening of information industry trade in general.

United States trade laws have a similarly narrow focus. Both the antidumping law[66] and the countervailing duty law[67] focus on "a class or kind of foreign merchandise,"making it virtually impossible for actions under them to address broader competitive issues raised by foreign "industrial targeting" of broad product sectors. And, since actions under those laws are generally brought by individual companies or industry sectors, they are far more likely to focus on narrow problems affecting a single part of the U.S. industry rather than on overall strategic issues.

The picture with regard to so-called "Section 301"[68] actions is a bit brighter, but not much. Section 301 was intended to remedy the excessively narrow focus of other trade laws, and confers sweeping powers on the President to "take all appropriate and feasible action within his power" in response to any foreign practice that "is unjustifiable, unreasonable, or discriminatory and burdens or restricts United States commerce."[69] However, although Section 301 could in theory support a wide variety of creative and far-reaching actions to promote free trade, it has been used almost exclusively as a means to attack foreign practices similar to those addressed by the antidumping and counter-

---

65 Tariff Schedules of the United States, 19 U.S.C. § 1 note (1982).

66 19 U.S.C. § 1673 (1982).

67 19 U.S.C §§ 1671 *et seq.* (1982).

68 Sections 301 *et seq.* of the Trade Act of 1974, as amended, 19 U.S.C. § 2411 *et seq.* (1982).

69 19 U.S.C. § 2411(a)(1)(B)(ii).

vailing duty laws, which is to say product-specific barriers. The results may benefit particular industries within the United States, but may not help -- and may even harm -- the position of U.S. information industries as a whole.[70]

A similar failing has afflicted even sector-wide negotiations such as MOSS and MAFF (Market Access Fact Finding). Although negotiators often start out with a mandate to deal with broad (if not always broad enough) areas, the realities of horse-trading soon take hold. In the absence of an overarching strategy beyond "get all you can," negotiators naturally begin bargaining over particulars. The patchwork that emerges may or may not be of benefit to U.S. industries as a whole, or to more open international trade in general.

C. The New Telecommunications Trade Legislation Underscores the Need To Develop an Overall Strategy

Some progress is being made on the trade law front. The new trade law mandates investigations by the United States Trade Representative regarding telecommunications products as a whole.[71] Furthermore, the bill sets specific negotiating objectives (such as nondiscriminatory procurement by foreign governments, national treatment of products and services provided by U.S. firms, type certification, and the adoption of open and transparent standard setting procedures)[72] that would benefit the global information services market as a whole if achieved.[73] That is the good news.

The bad news is that the trade bill calls into play U.S. trade measures without the assurance that those measures will be clearly tied to an overall strategy. The trade bill will launch a process of identifying countries for priority negotiations,[74] leading ultimately to a judgement of whether that country has achieved sufficient progress

---

70 Another factor that has reduced the efficacy of U.S. trade policy is the tendency of U.S. trade negotiations to focus on "process" rather than results. For example, the agreement with NTT focused on the removal of procedural barriers, rather than whether actual increases in foreign purchases should result.

71 Omnibus Trade Act, *supra*, §§ 1373-74.

72 *Id.*, § 1375.

73 *Id.*, § 1375(d).

74 *Id.*, § 1374.

toward "mutually advantageous market opportunities" that retaliatory trade measures are not called for. The complexity of the issues, the range of interests at stake and the need to coordinate efforts across countries and regions all point to the need for an overall model.

D. The Fragmentation of U.S. Policymaking Complicates Development of a Consistent National Policy

The problems with U.S. trade law and with the inherent character of trade negotiation are complicated by the manner in which U.S. policymakers are organized *within* the government. Regrettably, the administration of the various applicable laws is not centralized in a single body with broad experience and expertise and with a mandate to promote global free trade in general and the United States' *overall* position in particular. Instead, responsibilities for different parts of the information industry are divided among a number of governmental agencies.[75] These agencies have varying degrees of expertise, varying constituent interests and different ideas about what is good for the United States, characteristics that make overall coordination a difficult and time-consuming task.[76]

Such a system is far from ideal, for the reasons set out above. It is, however, about all that can be expected absent a coherent national policy designed to address trade issues in the information age. The following Section will discuss the Federal Communications Commission's effort to inject itself into the debate and its attempt to develop a U.S. trade policy in this area.

---

75 *See* House Comm. on Ways and Means, Overview and Compilation of U.S. Trade Statutes, H.R. Rep. No. 1, 100th Cong., 1st Sess., 135-146 (1987).

76 *See* McGivern, U.S. International Telecommunications and Information Policy: Congress Considers Reorganizing Policymaking, 15 Law & Pol. Int'l Bus. 1297, 1298-99 (1983).

Section V — The FCC Is Undertaking New Initiatives Concerning Trade Policies Against A Past Track Record of Mixed Results in Attempting to Promote Open Foreign Markets

A. The FCC Has Initiated Efforts To Define a U.S. Model

In the absence of a long-term approach for achieving Information Age telecommunications and trade goals, the FCC recently seized the initiative. In its proceeding called *Regulatory Policies and International Telecommunications*,[77] the Commission is attempting to develop a model for analyzing and resolving trade issues in the telecommunications field. This effort has attracted substantial attention and controversy.

The FCC's inquiry into trade issues was precipitated by dissatisfaction with German and French action excluding an AT&T/Philips joint venture from a French switching contract.[78] In general, the Commission sought advice concerning the appropriate regulatory responses to foreign trade barriers to U.S. carriers, service providers and vendors. In particular, the proceeding expressed an intent to develop criteria for developing a decisionmaking matrix to govern telecommunications and trade questions.

In order to accomplish this task, the Commission set forth a methodology to judge the relative competitiveness of foreign countries. This model included consideration of the following elements:

- Open entry;
- Non-discrimination;
- Technological innovation; and

---

77 2 F.C.C. Rcd. 1022 (1987).

78 *See* Staff of Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce, H.R. Doc. 100-1, 100th Cong., 1st Sess. (1987); Gilhooly, "The Politics of Switching," *Telecommunications*, Jan. 1987, at 26.

- International comity.[79]

The Commission conducted a thorough review of each of these factors, comparing its policies in the domestic arena with what was likely to be found abroad.[80]

The agency proposed that these factors be used to render judgments about particular foreign countries and any need for reciprocal trade actions. In particular, the FCC inquired whether it should begin the practice of conditioning entry into the U.S. market for foreign carriers, service providers and manufacturers based on the relative openness of their home markets.[81]

To support such an undertaking, the FCC also proposed the adoption of sweeping new rules designed to assist it in making openness determinations about other countries in relation to the U.S. market. Rather than confining its focus beyond U.S. shores, however, the FCC proposed to adopt wide- ranging reporting requirements covering all entities doing business in the United States.[82] These reporting rules concerned four types of entities:

1) *Carriers*: The Commission proposed that all U.S. carriers — even though deregulated — be required to file statements of ownership.[83] Carriers revealed to be foreign-owned would be further required to provide the agency with quarterly traffic and revenue reports.[84]

2) *Enhanced Service Providers*: Like carriers, enhanced service providers would be require to file ownership statements, and foreign providers would be obligated to report traffic and revenues.[85] Moreover, the Commission proposed that — although optional for U.S. enhanced

---

79 2 F.C.C. Rcd. at 1022.

80 2 F.C.C. Rcd. at 1024-31.

81 2 F.C.C. Rcd. at 1023, 1025-26, 1028, 1030, 1031-35.

82 *Id.* at 1035-37.

83 *Id.* at 1035-36.

84 *Id.*

85 *Id.*

service providers — foreign enhanced service providers be required to obtain RPOA certification.[86]

3) *Terminal Equipment Manufacturers*: Manufacturers of Part 68 equipment are already required to disclose country of origin.[87] The FCC proposed to augment this obligation by requiring an annual report of U.S. sales.[88]

4) *Users of "Core" Equipment*: The Commission set forth a new category of "core" switching and transmission equipment used by common carriers.[89] The agency proposed to require U.S. common carriers to report all purchases of such equipment so that the FCC could determine the penetration of foreign suppliers into this market.[90]

The FCC proposed to utilize the information gathered therefrom to assess the relative openness of foreign markets.

The reaction of commenters was almost uniformly negative. Of the 48 entities filing comments in the opening round, only a handful favored any portion of the FCC's action. Oppositions were filed by U.S. carriers,[91] enhanced service providers and their representatives,[92] users,[93] and equipment manufacturers.[94] Even other elements of the

---

86 *Id.*

87 *See* 47 C.F.R. § 68.300(b)(4) (1987).

88 2 F.C.C. Rcd. at 1036.

89 *Id.* at 1022 n.5.

90 *Id.* at 1036-37.

91 *E.g.*, Ameritech, Bell Atlantic, Contel.

92 *E.g.*, ADAPSO, Telenet.

93 *E.g.*, Aeronautical Radio, United States Council for International Business.

94 *E.g.*, Digital Equipment Corp., IBM.

U.S. government recommended against the FCC's plan,[95] and foreign governments[96] and foreign-based communications providers[97] were particularly vociferous.

The commonly expressed reasons for opposition were easy to understand. Most commenters questioned the FCC's jurisdiction over matters of trade negotiation, which is a function constitutionally confined to the executive branch.[98] Commenters also took issue with the FCC's suggestion that trade policy fell within the general rubric of the Commission's public interest mandate, absent specific legislation.[99] Several entities raised the potential inconsistency of the Commission's plan with the General Agreement on Tariffs and Trade (GATT),[100] and various Friendship, Commerce and Navigation treaties.[101] And, even were the agency to possess statutory or other authority, several commenters noted that the Commission lacked the necessary expertise in the international arena successfully to implement trade and reciprocity policies.[102]

Even apart from issues of jurisdiction and expertise, several commenters suggested that the policy could hurt U.S. business more than it would help. Some entities advised that artificial restrictions on the ability of U.S. carriers to purchase foreign manufactured

---

95 *E.g.*, Department of Defense, National Telecommunications and Information Administration.

96 *E.g.*, the Canadian Embassy, the Delegation of the Commission of the European Communities.

97 *E.g.*, Cable and Wireless of North America, Communications Industry Association of Japan, Dialcom, Inc., Ericsson North America, Siemens Capital Corporation.

98 *See* Comments of Siemens Capital Corp at 17-19, *citing* United States v. Curtiss-Wright Export Corp., 299 U.S. 304, 319 (1936) ("In this vast external realm, with its important, complicated, delicate and manifold problems, the President alone has the power to speak or listen as a representative of the nation.").

99 *See* Comments of ARINC at 14-15, *citing* Community Television of S. Cal. v. Gottfried, 459 U.S. 498, 510 n.17 (1983) ("[The FCC's] general duty to enforce the public interest does not require it to assume responsibility for enforcing legislation that is not directed at the agency . . .") and NAACP v. FPC, 425 U.S. 662, 670 (1976) (FPC directive to regulate carriers' rates did not permit agency to enforce anti-discrimination policies).

100 *E.g.*, Delegation of The Commission of the European Communities at 3.

101 *E.g.*, Comments of Vodavi Corp. at 20-23.

102 *E.g.*, Comments of ADAPSO at 9-11.

equipment could actually detract from U.S. competitiveness.[103] DIGITAL itself went further:

> Execution of the Commission's far-sighted [ONA] plan for new network architectures will require carrier access to the best possible central office equipment. In order to meet these requirements, carriers should feel free to tap high technology where ever it may be made. In light of the world-wide market for telecommunications products, this could well include overseas products. Thus, the Commission's plan could inadvertently create reticence by carriers to seek out the best possible equipment available in the global marketplace and, in so doing, impair the full public benefits of its *Computer III* plan.[104]

DIGITAL also suggested that the reciprocity and reporting requirement proposals amounted to an unnecessary intrusion into the unregulated computer hardware and services marketplace[105] and placed at risk vast quantities of commercially sensitive information that the Commission would now require be relinquished to the Federal government.[106]

Finally, several commenters noted the potential for foreign retaliation. These entities suggested that adoption of reciprocal trade policies would almost certainly force foreign governments to respond with similar policies, thus having further unintended effects of stifling U.S. entry abroad.[107]

In response to these comments, the Commission issued a *Report and Order* in the spring of 1988.[108] Conspicuously absent from its decision was any determination to condition the entry of foreign communications providers on reciprocity concerns. Indeed, the FCC again questioned whether it possessed the authority to act in the trade area, but

---

103 *E.g.*, Comments of Ameritech at 5-6.

104 Comments of Digital Equipment Corp. at 13.

105 *Id.* at 9-10.

106 *Id.* at 10-11.

107 *E.g.*, Comments of IBM at 9.

108 Regulatory Policies and International Telecommunications, 64 Rad. Reg. 2d (P & F) 976 (1988) [hereinafter "Reciprocity Report and Order"].

— notwithstanding the fact that the matter had been fully briefed — failed to resolve the issue.[109]

The Commission also cut back its initially proposed reporting requirements. The *Report and Order* declined to require reports regarding terminal equipment[110] and enhanced services.[111] The Commission did, however, adopt requirements that large U.S. carriers make annual reports of purchases of "core" equipment,[112] and foreign-owned common carriers[113] report U.S. traffic and revenues each quarter.[114] As authority to implement these rules, the FCC pointed to Sections 211, 215 and 218 of the Communications Act,[115] which permit the gathering of information from carriers[116] and Section 4(i) and (j) of the Act, which grants the Commission substantial discretion in choosing particular regulatory procedures.[117]

---

109 *E.g.*, Reciprocity Report and Order, 64 Rad. Reg. 2d (P & F) at 987 ("We invite parties to file comments on the proper role of the executive branch, including whether we should consider, propose, or take action in this area only after some specified determination by the President or his designated representative, based on U.S. trade, investment, commercial, defense and foreign policy considerations."). Given the volume of comments already submitted on this issue, however, the FCC's renewed request for further discussion is at best a temporizing effort and, more likely, an outright retreat.

110 Reciprocity Report and Order, 64 Rad. Reg. 2d (P & F) at 990-91.

111 Reciprocity Report and Order, 64 Rad. Reg. 2d (P & F) at 999.

112 *See* New Section 63.801 of the Rules. This requirement extends only to "Tier I" local exchange carriers and interexchange carriers with more than $ 100 million in annual revenues.

113 For the purpose of this rule, the Commission defines "foreign owned" as a company more than 15 percent owned by a "foreign telecommunications entity" or where a representative of such an entity sits on its board of directors. *See* New Rule Section 43.61(b). Compare this definition with that of the Communications Act, for which an entity must be 20-25 percent alien owned before it will be considered foreign, and includes holdings by individual non-U.S. investors as foreign ownership. *See* 47 U.S.C. § 310(b).

114 Reciprocity Report and Order, 64 Rad. Reg. 2d (P & F) at 995.

115 Reciprocity Report and Order, 64 Rad. Reg. 2d (P & F) at 986 & n.36, 995 & n.78.

116 47 U.S.C. §§ 211, 215, 218 (1982).

117 47 U.S.C. § 154(i-j) (1982).

Several parties — including NTIA — petitioned for reconsideration of the new rules, claiming again that they exceeded the agency's authority.[118] Shortly thereafter, the Office of Management and Budget, part of the Executive Office of the President, rejected the FCC's proposed form to be used to collect information.[119] OMB cited a few procedural problems and complained that the reporting requirements represented a substantial and non-productive burden on U.S. industry.[120] OMB, however, did not limit itself to procedural issues:

> [W]e believe that the Commission, in setting these requirements, goes beyond the scope of its statutory authority, and that the Commission cannot and must not take action, even with respect to information collection, on trade policy grounds . . . In addition, we believe FCC [sic] is proposing an inconsistent course of action: the Commission intends to investigate whether foreign countries impose discriminatory requirements on U.S. firms, and to conduct this investigation by imposing a discriminatory requirement on foreign firms.[121]

As a result of OMB intervention the new rules have been stayed.[122] The FCC's ultimate response to this unforseen development remains uncertain at this time.

B. Past FCC Forays Into Trade Issues Have Met With Mixed Results

The current FCC proceeding is not its first venture into trade issues involving telecommunications. Over the past decade, the Commission has periodically sought to facilitate access for U.S. carriers, vendors and suppliers into foreign markets. Most prominent among those undertakings have been past attempts to extend domestic *Computer II* and resale policies to international services along with efforts to inject

---

118 On May 18, 1988, Petitions for Reconsideration were filed by BellSouth Corp., GTE Service Corp., NTIA and Siemens Capital Corp.

119 Letter from James B. MacRae, Jr., Acting Administrator, Office of Information and Regulatory Affairs to Edward J. Minkel, Managing Director (May 20, 1988).

120 *Id.* at 1.

121 *Id.* at 2.

122 Regulatory Policies and International Telecommunications, DA 88-895 (June 15, 1988).

competition into international services. As discussed below, these efforts have had mixed results.

1 FCC Attempts to Extend Domestic Resale Policies to International Services

In the late 1970s, the FCC began to view entities that "resold" transmission capacity in a different light. Starting with private lines[123] and continuing with the public switched facilities,[124] FCC decisions forced U.S. carriers to permit users to resell their services. In 1980, the Commission determined to extend this policy to the international sector. Accordingly, it proposed a plan requiring U.S. international carriers to remove any restrictions on resale contained in their tariffs.[125] It did not, however, undertake to discuss its plans or goals with other administrations before releasing its proposal.

Perhaps due to the lack of prior consultation, foreign administrations "greeted [the proposal] with protest"[126] in the form of letters to the FCC and complaints to U.S. carriers. One of their principal criticisms was that the U.S. had *only two years previously* agreed to a set of non-binding international rules that included a prohibition on international resale.[127] The FCC's about face was viewed not only as a failure to accord proper weight to comity interests but as evidence of an inability fully to coordinate policy

---

123 Resale and Shared Use, 60 F.C.C.2d 261 (1976), *recon.*, 62 F.C.C.2d 588 (1977), *aff'd sub nom.* AT&T v. FCC, 572 F.2d 17 (2d Cir.), *cert. denied*, 439 U.S. 875 (1978).

124 Public Switched Network Resale, 83 F.C.C.2d 167 (1980), *recon. denied*, 86 F.C.C.2d 820 (1981).

125 International Resale, 77 F.C.C.2d 831 (1980).

126 Rein, *et al.*, Implementation of a U.S. "Free Entry" Initiative for Transatlantic Satellite Facilities: Problems, Pitfalls, and Possibilities, 18 Geo. Wash. J. Int'l L. & Econ. 459, 484 (1985).

127 *See* Markowski, Telecommunications Regulations as Barriers to the Transborder Flow of Information, 14 Cornell Int'l L. J. 287, 322-24 (1984). The policies are contained in recommendations of the Consultative Committee on International Telephone and Telegraph, an organ of the ITU. *See* CCITT, Red Book on International Telecommunications Services, Recommendations D.1, §§ 1.7, 1.8, 1.10 (1985). The CCITT recommendations in place in 1980 were identical to those in force today.

planning within the U.S. government itself.[128] This confusion was viewed by some as undercutting other U.S. positions before the ITU.[129]

Moreover, PTTs viewed the one-sided change as a threat to "operational sovereignty."[130] They therefore threatened to eliminate private lines (or the flat-rate pricing thereof) were the FCC to proceed with its plan.[131] Indeed, the head of the CCITT itself wrote the U.S. State Department expressing displeasure at the FCC's action.[132]

This threat of retaliation was enough to provoke interest from other sectors of the U.S. government. As reported by NTIA, elimination of flat-rate pricing was feared to have a dramatic effect on U.S. defense policy:

> In part because of the controversy over application of the FCC's *Computer II* and international resale actions, some overseas administrations may review their policies concerning private leased service. Should this happen, the U.S. business community and the Department of Defense would face major cost increases for international telecommunications, estimated in DOD's case to be as high as 300-700 percent.[133]

As testimony to the fragmentation of U.S. telecommunications policy, the Defense Department itself lobbied the FCC to withdraw its plan and to coordinate its efforts in the international arena with DOD before taking any action. U.S. carriers, as well, made their opposition to the FCC's plan known.[134]

---

128 Markowski, *supra*, at 324.

129 Frank and Long, International Effects of the Competitive Carrier and Computer II Rulemakings, 26 (NTIA, Office of International Affairs 1982).

130 Frieden, International Telecommunications and the Federal Communications Commission, 21 Colum. J. Trans. L. 424, 443 (1983). The PTTs feared resale carriers would be able to gain "access to its domestic network surreptitiously, without its consent, and in a manner that jeopardizes its financial viability." *Id.*

131 *Id. See also* Markowski, *supra*, at 297-302 (describing other efforts to eliminate flat-rate pricing for leased lines).

132 *See* Letter from Leon Burtz, Director, CCITT, to Arthur Freeman, Director, Office of International Communications Policy, U.S. Department of State (June 20, 1980).

133 NTIA, Long Range Goals in International Telecommunications and Information: An Outline for United States Policy 143 (1983).

134 *See* ITT Comments, Docket 80-176 (filed Aug. 15, 1980).

Given the scope of the controversy, the FCC has let the proposal die.[135] Ironically, since that time, many U.S. international carriers themselves negotiated with foreign PTTs the elimination of resale restrictions on their tariffs.[136] Thus, although resale or shared use generally are prohibited internationally by the foreign correspondent, no action of any U.S. entity forms part of the restriction. Given this impasse, the FCC has described the rulemaking as "moot."[137]

2 *FCC Attempts to Extend Computer II Policies to International Services*

Only slightly better results were achieved with the FCC's determination to apply its *Computer II* and *Computer III* policies internationally. In initially setting forth its dichotomy between basic and enhanced services,[138] the FCC stayed its application internationally.[139] Just a few months later, the agency — in a single sentence, unexplained footnote — determined to apply the new rules to the international marketplace.[140] The Commission ultimately upheld the latter decision,[141] and continued this policy by applying *Computer III* internationally.[142]

Excellent arguments can be made that application of the basic/enhanced dichotomy to U.S. international carriers would not impinge any foreign prerogatives. The FCC, however, acted without having prior discussions with foreign partners, and unilaterally

---

135 *See* Telecommunications Reports, Aug. 8, 1983, at 27 (discussing letter from Jack D. Smith, Chief, Common Carrier Bureau, to Congressman Gary L. Ackerman).

136 *See, e.g.*, AT&T Co., Transmittal No. 92 (June 14, 1984).

137 *See* Telecom Plus, Int'l, File No. I-P-C-83-029, ¶ 7 n.4 (Aug. 3, 1984).

138 *See supra*, at Section II.A.

139 Second Computer Inquiry, 77 F.C.C.2d at 488-89.

140 Second Computer Inquiry, 84 F.C.C.2d at 53 n.4.

141 *See* GTE Telenet, 100 F.C.C.2d 776 (1985), *aff'g*, 91 F.C.C.2d 232 (1982).

142 Computer III, 2 F.C.C. Rcd. 3072, 3108 (1987).

forced detariffing of international enhanced services. As a result, foreign confusion and protest again greeted the FCC's action.[143]

Indeed, only after years of patient explanation has the FCC's policy gotten off the ground. The U.S. persuaded Canada to adopt the basic/enhanced dichotomy,[144] which formed the basis for the application to telecommunications of the recent Free Trade Agreement between the two nations.[145] The U.S. also successfully advocated the inclusion of a provision in the CCITT Recommendations covering the ISDN that created a distinction in regulatory treatment quite similar to, and consistent with, the *Computer II* rules.[146] More recently, the U.S. has cooperated with ongoing activities of the Organization for Economic Cooperation and Development — an association of developed nations — designed to form a common scheme for distinguishing between types of services along the lines of the basic/enhanced dichotomy.[147]

3 *FCC Attempts to Promote Competition in International Services*

Even before its attempts to promote pro-competitive international telecommunications policies, the FCC had made at least one previous effort to alter the structure of U.S.-foreign telecommunications. This attempt actually involved substantive FCC views on international trade principles similar to those the agency later took in its *Reciprocity* proceeding. This attempt was no more successful than its more recent effort.

The Commission's attempt, which was designed to promote access for U.S. carriers to the international services market, came in the *French Telegraph Cable* case.[148] There, the agency invoked general principles of reciprocity derived from the Cable Landing Act

---

143 *See* Telefax from L. Burtz to Mark S. Fowler (Sept. 23, 1982).

144 Roseman, Towards a New International Framework for Telecommunications and Information Services: Issues and Prospects 10 (1988) (study funded by Canadian Department of Regional Industrial Expansion).

145 *See* U.S.-Canada Free Trade Agreement, Sectoral Annex C, Art. 7 (Jan. 2, 1988).

146 Integrated Services Digital Networks, 98 F.C.C.2d 249, 270 (1984).

147 Roseman, *supra*, at 11-12.

148 French Telegraph Cable Co., 71 F.C.C.2d 393 (1979).

Landing Act and applied them in the context of a decision under Section 214 of the *Communications Act* to deny the application of a French-government controlled U.S. corporation to expand its transatlantic record carriage through San Francisco and Washington, D.C.[149] The FCC's action attempted to pressure the French government into reciprocally opening additional French gateway cities for U.S. transatlantic record carrier operations.

The Commission's policy was less than successful. Serious questions were raised as to the agency's statutory authority to engage in substantive trade policy. Moreover, no French liberalization whatsoever was achieved: the French simply sidestepped the FCC by selling its interest in the international carrier to non-governmental entities,[150] permitting the carrier to assert that it should not bear the brunt of a U.S. opposition to French policy.

Subsequently, the FCC openly renounced the use of domestic licensing restrictions as a forcing tactic and suggested that calls for such actions were "more appropriately addressed to other branches of government."[151] Indeed, just a few years later, an FCC staff analysis drafted in response to an inquiry from Senator Lautenberg cast serious doubt on the agency's ability to evoke reciprocity policies in considering applications for equipment approval under Parts 15 and 68.[152] Accordingly, at least before beginning its current international proceeding, it appeared that the FCC had abandoned any intention to delve into trade policy.[153]

---

149 *Id.* at 403-08.

150 FTC Communications, 75 F.C.C.2d 15 (1979).

151 Foreign Ownership of CATV Systems, 77 F.C.C.2d 73, 81 (1980).

152 Common Carrier Bureau Analysis of the Options Available to the Federal Communications Commission to Promote Trade Opportunities for U.S. Telecommunications Firms 2 (1985) ("the Bureau staff has concluded that, absent an amendment to the Act or other specific grant of statutory authority, it is far from clear that the Commission could lawfully amend its rules to withhold certification of foreign equipment on trade reciprocity grounds. . . . The analysis further concludes that it is far from clear that the Commission could rely on its ancillary jurisdiction to incorporate trade criteria into its regulatory program for terminal equipment.").

153 *See supra*.

C. *The U.S. Has Enjoyed Success Through Coordinated Decisionmaking and Consultation with Foreign Governments*

The foregoing is not to say that the U.S. has not achieved significant results in international telecommunications with the assistance of the FCC. Indeed, by its leadership example, the U.S. has exerted a substantial influence on the structure of international telecommunications. Through patient negotiations with foreign governments, undertaken only after development of a unified U.S. position, some of these ideas have taken hold abroad.

Over the last decade and a half, the FCC, Congress and the Courts have adopted numerous measures designed to reduce the regulatory burden on U.S. domestic common carriers and otherwise streamline governmental oversight of communications providers. These actions include the deregulation of enhanced[154] and resale service providers,[155] the proliferation of private networks,[156] the divestiture of the monopoly from the competitive aspects of the telephone system[157] and the liberalization in allowance of foreign operations inside the U.S.[158] Such actions have contributed to making the U.S. communications industry among the strongest in the world.

Some of these actions have led foreign administrations to pursue similar approaches adapted to their national experience and conditions. For example, the principal aim of the British Telecommunications Act of 1984 was "to transfer the provision of telecommunication services to the private sector and subject it to the

---

154 *See supra* for a discussion of the *Computer II* and *Computer III* decisions.

155 *See* Competitive Common Carrier, 91 F.C.C.2d 59 (1982).

156 *See* Lightnet, FCC 85-276 (May 20, 1985); Allocation of Frequencies Above 890 Mc., 27 F.C.C. 359 (1959).

157 United States v. AT&T, 552 F. Supp. 131 (D.D.C. 1982), *aff'd mem. sub nom.* Maryland v. United States, 460 U.S. 1001 (1983).

158 Letter from Chief, Domestic Facilities Division to Counsel for Reuters (Sept. 23, 1982) (permitting foreign-owned "private" earth stations); Cable & Wireless Communications, Inc., DA-87-148, ¶ 10 (Feb. 20, 1987) (permitting Cable & Wireless to establish a U.S. domestic network).

forces."[159] The Act therefore ended the exclusive privilege of British Telecom,[160] paved the way for the privatization of that organization,[161] permitted the development of Mercury — a competing public network[162] — and numerous private networks,[163] and liberalized many forms of resale and shared use.[164] The result is that Britain is now in a condition similar to the U.S. telecommunications market in the late 1970s; that is, beginning to be increasingly competitive.[165]

The Japanese, as well, have begun to modernize their approach. A few years ago they separated their long distance form local exchange carriers, in a manner similar to the AT&T divestiture.[166] Thereafter, the Japanese Diet passed a new telecommunications law, substantially liberalizing the opportunities for non-facilities based competition,[167] including by non-Japanese entities.[168] Thus, although there are still areas of dispute,[169] Japan is substantially more liberal today than it was just a few years ago. In the case of both Britain and Japan, the U.S. was able to lead by example

---

159 R.N.D. Hamilton, Telecommunications Act 1984: The Practitioner's Companion 7 (1984).

160 Telecommunications Act 1984, Chapter 12, § 2.

161 *Id.*, §§ 60-73.

162 "Regulation of Satellite Business Services Seen in U.K.," Satellite Week, April 13, 1987, at 4.

163 *See* U.K. Department of Trade and Industry, Class License for the Running of Telecommunications Systems Providing Value Added and Data Service (1987).

164 *See* U.K. Department of Trade and Industry, Explanatory Guide to the Telecommunications Class License for the Running of Systems for Value Added and Data Services (1987).

165 As an example of the parallel, the British Office of Telecommunications has recently concluded a series of negotiations between Mercury and British Telecom regarding the price the former would pay for access to the latter's local network. Noam, International Telecommunications in Transition at 28-30 (May 9, 1987). These discussions have a striking resemblance to the ENFIA negotiations of the late 1970s and early 1980s.

166 "Japanese Cabinet Passes Communications Law," Telephony, Jan. 14, 1985, at 13.

167 Japanese Business Telecommunication Law, Art. 21.

168 Only so-called "Type I," *i.e.*, facilities-based carriers, are required to be substantially Japanese owned. *Id.* Art. 11.

169 *See* Letter from C. William Verity, Secretary of Commerce to Masaaki Nakayama, Minister of Posts and Telecommunications (July 29, 1988) (complaining about a Japanese proposal to require adherence to optional CCITT protocols for even private networks). *See also* United States General Accounting Office, U.S.-Japan Trade: Evaluation of the MOSS Talks at 17-25 (1988) (detailing Japanese concessions and unresolved issues).

which, so long as American policymakers were patient, ultimately was translated into foreign liberalization.

Similar liberalization is taking place on the European continent. In an effort that would have been unheard of only a few years before, the European Community released a "Green Paper" on telecommunications liberalization.[170] The EEC recommended that European PTTs attempt to develop a truly common market in telecommunications goods and services, in order that they could better compete with U.S. and Japanese entities.[171] One of the principal recommendations for achieving such a goal was a liberalization of the regulatory structure of telecommunications in Europe.[172] The Green Paper recommended that this be accomplished through careful limitation on the scope of monopoly power permitted the PTTs,[173] and a separation of exclusive from competitive telecommunications functions.[174]

Even while debate on the Green Paper's findings persists,[175] some nations have already begun to implement its conclusions. One of the most important recommendations of the EEC was for the European governments to separate the

---

170 Commission of the European Communities, Towards a Dynamic European Economy: Green Paper on the Development of a Common Market for Telecommunications Services and Equipment (June 30, 1987) (hereinafter "Green Paper").

171 The Green Paper recognized that "technological change is penetrating irreversibly the European and world market and requires adjustment of market conditions." Commission of the European Communities, Towards a Competitive Community-Wide Telecommunications Market in 1992: Implementing the Green Paper on the Development of the Common Market for Telecommunications Services and Equipment 6 (Feb. 1988) (hereinafter "Implementing the Green Paper"). *See also* EEC, The Benefits of Completing the Internal Market for Telecommunication Equipment and Services in the Community at 10-11 (1988) (detailing relative market sizes).

172 Williamson & Purton, "The break of Europe's order leads to new liberalization," Telephony 36 (Mar. 28, 1988).

173 The Green Paper did not, however, go so far as to recommend that resale and shared use of leased lines be permitted. *See* United States Department of State, Analysis of the Draft EC Green Paper at 9 (1987) ("The Commission states that both the prohibition of voice resale and the form of tariff for leased lines must remain the prerogative of the PTT in each Member State.").

174 Green Paper at 64-67; Implementing the Green Paper at 9.

175 *See* Implementing the Green Paper at 24-28 (detailing the issues upon which no consensus has been reached).

operational from regulatory communications activities of their PTTs.[176] Such a policy was included in the recently passed telecommunications reform laws in the Netherlands,[177] and France[178] and is under consideration in the Federal Republic of Germany as well.[179] Although such plans fall well short of complete privitization, they nonetheless represent major steps toward more closely reflecting the competitive telecommunications evidenced in the United States.[180]

The U.S., through the Department of Commerce, the FCC, USTR, and the Department of State, has sought to encourage these deregulatory efforts. The competitive U.S. telecommunications industry painstakingly built by decades of FCC decisions provided one source of experience for foreign governments to draw upon. Moreover, given the trend of technology, PTTs have encountered market pressures similar to those emerging in our country. The U.S. and FCC have supported these efforts through direct negotiations, and have been far more successful then prior initiatives.

The U.S. has also reached a tentative accord with Canada on many telecommunications issues. In late 1987, the two nations finalized a Free Trade Agreement (FTA) covering a wide range of good and services,[181] including a Section on "Computer Services and Telecommunications-Network-Based Enhanced Services."[182]

---

176 *See* Implementing the Green Paper at 18 (recommending a "[c]lear separation of regulatory and operational activities, in order to prevent possible abuses of a dominant position in type approval, licencing, etc. by the Telecommunications Administrations acting both as regulator and as competing operator.").

177 Dawkins, "European Telecommunications: The Stakes are High," Financial Times, May 11, 1988, at XI.

178 *See* "France's Proposed Telecommunications Bill," Transnational Data and Communications Report at 22-25 (Oct. 1987).

179 *See* Government Commission for Telecommunications, Restructuring of the Telecommunications System (E. Witte ed. 1987). For a discussion of the Witte Commission's findings, *see* Aronson and Cowhey, When Countries Talk 181-82 (1988).

180 Aronson & Cowhey, *supra*, at 182.

181 U.S.-Canada Free Trade Agreement (Jan. 1988).

182 *Id.*, Service Sector Annex C. The agreement does not cover "basic" telecommunications services but does require granting to enhanced service providers non-discriminatory access to the basic telecommunications networks of each nation.

The agreement seeks to freeze or eliminate discrimination[183] and barriers to trade in telecommunications services.[184] Although not yet finally approved in Canada,[185] the detailed and patiently negotiated agreement stands to become a fundamental building block for relationships between the two nations and an exemplary bilateral for relations between the U.S. and other countries.[186]

Perhaps the best test of U.S. negotiating abilities will come later this year at the World Administrative Telegraph and Telephone Conference (WATTC). WATTC, which will take place in late November to early December 1988, will consider revisions to the current telegraph and telephone regulations, which have treaty status.[187] The WATTC was prompted by a desire of the ITU to "establish, to the extent necessary, a broad international regulatory framework *for all existing and foreseen new telecommunications services*."[188]

Some foreign government have responded by proposing sweeping new regulations that potentially could cover numerous services that are unregulated under U.S. law.[189] The U.S. has protested such moves and claimed that oversight of enhanced and value

---

183 The agreement contains a provision mandating each nation to afford "national treatment" to the goods and services of the other country. *Id.*, Art. 105.

184 The agreement explicitly encourages the maintenance of flat-rate leased lines, permits the resale or shared use of basic services, and authorizes the attachment of customer premises equipment. *Id.*, Service Sector Annex C, Art. 3. The agreement also requires each government to attempt to ensure that any communications monopoly it authorizes would not "engage in anticompetitive conduct in the enhanced services market." *Id.* Art. 5. The agreement excludes so-called "cultural industries," *id.*, Art 2005, which is defined to include print and electronic mass media. *Id.*, Art. 2012.

185 Although already approved by the Canadian Parliament, Canadian Prime Minister Mulroney has called national elections on November 21, 1988, to validate the agreement. *See* "Trade Ties with U.S. Are at Issue as Ottawa Sets Nov. 21 Election," Wall Street Journal, Oct. 3, 1988, A1, col. 1. On the U.S. side, President Reagan signed the FTA, after House and Senate consideration, on September 28, 1988. Pub. L. No. 100-449, § 101(a), 102 Stat. 1851 (1988).

186 G. Feketekuty, International Trade in Services 187 (1988).

187 *See* WATTC-88, FCC 88-36, ¶¶ 2-3 (Feb. 9, 1988) [hereinafter "WATTC Notice"].

188 ITU Res. 10 (Nairobi, 1982) (emphasis added).

189 WATTC Notice, ¶ 7.

added services lies beyond the jurisdiction of the ITU.[190] The U.S. has approached this disagreement carefully, seeking to "form an international consensus to refine the present draft International Telecommunications Regulations in a manner that more fully reflects the principal purposes and goals of the ITU."[191] DIGITAL, itself, has been one of the prime forces behind promoting "a spirit of consensus, cooperation, and compromise."[192]

Already this strategy has paid off. By patiently explaining the U.S. view and noting the potential for refusing to ratify a treaty revision containing certain proposals, the U.S. negotiators have already succeeded in forcing the ITU itself to intervene. After the last drafting session, ITU Secretary General Butler proposed modified regulations designed to work a compromise between pro-competition nations such as the U.S. and the rest of the world.[193] Although this new draft is not entirely to the U.S. liking,[194] it does represent a starting point through which U.S. negotiators can work.

* * *

In sum, the FCC has had mixed results in its past attempts to set trade policy. Problems have typically arisen where the U.S. has (1) failed to fully coordinate its policy with other agencies of the U.S. government that have relevant expertise; (2) relied upon questionable legal jurisdiction over trade issues; and (3) neglected to consider principles of comity. In contrast, U.S. leadership — through all coordinate govern-mental branches — by example and patient negotiations is now having more positive effects upon national policies of major trading partners.

---

190 WATTC-88, 64 Rad. Reg. 2d (P & F) 1427, 1434 & n.47 (1988) [hereinafter "WATTC Report and Order"]; Nugent, "WATTC-88: Global Harmonization or Entirely New International Law?" (1987).

191 WATTC Report and Order, 64 Rad. Reg. 2d (P & F) at 1432.

192 *Id.*

193 "Wrangling with Resolution of International Telecom," Communications Week, April 12, 1988, at 12.

194 *See* United States Proposals for the 1988 World Administrative Telegraph and Telephone Conference (Aug. 1988).

Section VI — DIGITAL Offers Some Initial Suggestions for Developing An Information Age Model for Telecommunications and Trade

A. Overview

In the foregoing sections, DIGITAL has illustrated the pressing need for an Information Age Model to guide telecommunications and trade policies. Technological and marketplace changes have clearly outdated past, piecemeal approaches to telecommunications policy formulation. While the FCC and U.S. trade officials have begun adapting their approaches to accommodate the increasing integration of transmission, computer systems and applications in today's telecommunications network, no shared vision of the industry and its future currently exists. As a result, U.S. policies in telecommunications and trade are less coordinated and cohesive than desirable.

DIGITAL believes that achievement of important telecommunications and trade goals requires a common, comprehensive framework for analyzing issues and choices facing U.S. policymakers. In order to assist in this process, DIGITAL has identified several threshold principles for discussion and evaluation. Specifically, they include five fundamental points:

1. Trade policy and telecommunications policy must be complementary.

2. U.S. policy must consider issues in terms of the broad Information Age marketplace rather than focusing unduly upon specific components.

3. Approaches to promoting U.S. access to foreign markets must be examined in terms of their compatibility with the evolution of national regulatory policies.

4. Pursuit of U.S. objectives requires a cost/benefit analysis of the practical short-term and long-term consequences for telecommunications and broader electronics trade interests.

5. Effective development and implementation of a sound Information Age policy requires a common, informed vision of technology and the marketplace.

These proposed principles are discussed below:

B. Principle 1: Trade Policy and Telecommunications Policy Must Be Complementary

Historically, telecommunications policies have developed in relative isolation from trade concerns. For example, the trade implications of the FCC's decision to adopt an equipment registration program for CPE was pursued without regard to the predictable entry of foreign companies into that market. Similarly, the FCC's decision to eliminate entry and tariff requirements for "non-dominant carriers" opened the door for participation of foreign-owned companies in that domestic U.S. business. Moreover, the Bell System was broken up, and long-standing supply relationships terminated between Western Electric and Bell Operating Companies, with little prior consideration of trade implications. This segmented approach continues to be evident in the recent trade law, which contains separate provisions for telecommunications trade, distinct from other market-opening initiatives

Trade policy with respect to telecommunications services and products has also tended to be shaped without any in-depth consideration of potential consequences for broader telecommunications policy. As detailed earlier, there are several obvious reasons for that reality. Trade policy, as reflected in both tariff negotiations and legislation, has focused upon specific subsets of goods and services, of which telecommunications has often been one small component. Representation of trade interests, furthermore, falls in the Executive Branch subject to Congressional oversight and legislative requirements. The Executive Branch trade officials and Congressional Committees responsible for trade tend to operate separate and independent both from the FCC and from telecommunications leadership within their own respective branches of government.

This detachment of trade from telecommunications has grown increasingly untenable for several reasons. First, U.S. telecommunications policy seems irrevocably committed to an open, robust marketplace in which any supplier is free to participate. Foreign suppliers have already penetrated this market and, as a result, become substantial entrenched sources of essential services and products for the U.S. telecommunications industry and its customers. Simply stated, imposition of trade restrictions on foreign-owned service providers and equipment vendors at this time would

require a sharp reversal in the direction of telecommunications policy and create severe dislocations for domestic telephone companies and consumers.

Second, achievement of U.S. domestic telecommunications policy goals — primarily, the ubiquitous, efficient availability of information services — requires the public telephone network to continue its evolution into an intelligent Information Age highway. In order to implement this transformation, domestic carriers need unfettered access to the next generation of switching, transmission, distribution, and interconnect components. In this regard, innovative manufacturers and service providers located throughout the world have substantial experience and capabilities to offer. Moreover, given the startling rate at which technology is advancing, domestic and foreign manufacturers should be free to enter into joint ventures in order to take full advantage of each others' expertise.

Just as importantly, a domestic telecommunications policy premised upon open market access has created opportunities — already evident — for exporting U.S. technology, products, services and knowledge. Indeed, computer companies such as DIGITAL and its domestic competitors have established strong business relationships with several major foreign governments and are helping to make these nations full-fledged participants in the Information Age. In addition, the BOCs, under waivers of the MFJ, are actively supplying a broad range of telecommunications services to countries on each continent. Similarly, domestic suppliers of mobile telecommunications services and associated equipment are finding receptive markets abroad. In other words, advances in domestic Information Age capabilities are enhancing U.S. competitiveness and trade opportunities overseas. Preserving and increasing such opportunities should be kept firmly in mind when trade policies are being developed.

In view of the compelling inter-relationship between telecommunications and trade interests, there is an overriding need for complementary — rather than contradictory — U.S. policies. This requires careful overall planning as well as continuous dialogue among designated telecommunications and trade decisionmakers. In such respects, studies directed by the new trade legislation may provide an initial vehicle for bringing these U.S. coordination considerations into focus.

C. Principle 2: Trade Policy Must Consider Issues in Terms of the Broad Information Age Marketplace Rather than Focusing Unduly Upon Specific Components

As we begin to understand the business models underlying our companies in the information industries, U.S. policy would be more alert to "win-win" opportunities. For example, the preoccupation with raising trade tariffs on telecommunications products to gain leverage has tended to obscure the obvious advantages of lowering tariffs on component-level products. The semiconductor and computer industries have demonstrated the appeal of this approach by spearheading the elimination of duties on computer components. Similarly, the United States could engage our trading partners in the elimination of duties on telecommunications components (*e.g.*, printed circuit boards). Such a step would benefit both consumers and producers be assuring them access to a worldwide technology pool at prices that are globally competitive.

As discussed at considerable length above, the technologies of transmission, switching, computing and software are converging. Switching hardware functions are often replaceable by software, on-site intelligence is interchangeable with remote processing power, and communications and computing hardware typically incorporate both functions whatever their nominal character. This level of convergence and interchangeability makes focus on narrow product or service lines futile, since other products or services are usually freely substitutable, and since the "ripple effects" of action in one area may have offsetting impacts in others.

The FCC, as discussed earlier, has spent the past two decades addressing the convergence of these technologies. Trade policymakers must do the same within their own areas of expertise. In the trade context, this means recognition that we now have one overarching Information Age market encompassing computers, communications, and other information-related goods and services. Trade policy must take into account the overall flow of goods and services, rather than simply focusing on particular sectors. International efforts along these lines, such as the E.C. Green Paper and the United States' review thereof, and the U.S.-E.C. High Technology Working Group should be encouraged and expanded. Similar efforts should be undertaken in other areas wherever the ground appears suitable.

U.S. trade officials should also recognize that the greatest weapon in the United States' arsenal is example. U.S. domestic policies over the past decades (although far

from ideal) have been very successful in promoting a thriving and innovative market in information technologies. Foreign countries with restrictive policies have, for the most part, done less well. The explosion of creativity in computing and communications set off by U.S. deregulatory efforts has excited admiration and emulation throughout the world. It has inspired efforts by foreign nations to tap the same wellsprings of creativity within their own borders, and to recognize that restrictive regulations may benefit particular constituencies within entrenched industries, but that they do so at the expense of national competitiveness and technological progress. The U.S. can continue this process by combining intelligent regulation of its domestic market with aggressive advocacy and explanation of the benefits that its more liberal policies have brought.

In the coming years there will be a number of opportunities to promote global market opening as more and more nations become convinced that such is in their interests. The Uruguay Round of GATT negotiations, with its emphasis on services and high technology issues will be one opportunity; the investigations and negotiations involved in implementation of the new U.S. trade bill will provide others. What is important is that U.S. trade officials recognize that the wave of change is on their side, and that it is a broad and irresistible one.

D. Principle 3: Approaches to Promoting U.S. Access to Foreign Markets Must Be Examined in Terms of Their Compatibility with the Evolution of National Regulatory Policies

In the past, the United States has attempted to export its deregulatory efforts in an aggressive fashion. As the discussion on that topic shows, those efforts have been less than successful. Instead, the United States is better off leading by example and allowing foreign nations to find their own paths to liberalization. When international trade was almost exclusively in goods and raw materials, nations that wished to succeed in commerce built ports, highways and railroads and sought to attract as much traffic as they could. Now that international trade increasingly involves services, nations are coming to recognize that to compete they must build an open and efficient information infrastructure.

The United States' goal should be to encourage this process, but not to attempt to graft U.S. solutions onto foreign circumstances — any more than it would impose U.S. speed limits on foreign highways or U.S. OSHA regulations on foreign dockworkers.

Other nations have their own needs and their own built-up regulatory philosophies; they view them as appropriate to their situations and resist sudden shifts. Where those philosophies interfere with the development of necessary information infrastructure they will be changed out of need, not because of U.S. pressure. The United States need not force the Information Age on foreign nations, as that Age is coming regardless of U.S. efforts. Instead, the United States should seek to make the transition as smooth and efficient as possible.

E. Principle 4: Pursuit of U.S. Objectives Requires a Cost/Benefit Analysis of Short-Term and Long-Term Consequences for Telecommunications and Trade Interests

American telecommunications and trade policies contain inherent tensions and cross-currents with respect to goals and objectives. For that reason, an Information Age Model needs to include a cost/benefit analysis of proposed actions with due regard for both short-term and long-term consequences. This is particularly true since problems in this arena can arise rapidly and in the context of specific controversies.

The Commission's pending inquiry into international telecommunications illustrates the potential for important actions arising in the context of isolated short-term considerations. As discussed earlier, the FCC's venture into trade questions was precipitated by complaints that a German organization was exerting undue influence upon the French Government in a major business transaction. The FCC's resulting initiative carried the threat of reciprocal trade actions.

The FCC, however, did not circumscribe its interests to the particular case at hand. Instead, comments were invited on how to shape an approach to long-term U.S. goals. Presumably, this development was designed to "send a message" overseas to increase leverage of U.S. companies in ongoing and future efforts to enter foreign markets.

The Commission's inquiry brings into focus the need for fully informed policy-makers to weigh short-term considerations against long-term objectives. Certainly, there are good and sufficient reasons to conclude that the FCC is not the right entity to preside over such issues. Unless trade and telecommunications issues are addressed in an integrated manner, pursuant to well-established guidelines, U.S. policy will be determined by reactive, ad hoc actions.

In conducting a cost/benefit analysis, several long-term factors need to be addressed. They include, for example, such considerations as (1) potential reactions of foreign administrations and effects of any new restrictions they might impose upon U.S.companies; (2) impact on efforts to encourage opening of foreign markets over time as a result of U.S. leadership "by example"; (3) effects on domestic U.S. telecommunications policies designed to ensure a deregulated, open marketplace; (4) effects upon U.S. goals of promoting advanced Information Age capabilities, services and products; and (5) impact upon U.S. exports and competitiveness overseas if access to foreign based technological advances is foreclosed. A comprehensive list of all such factors needs to be developed to aid in decisionmaking.

F. Principle 5. Effective Development and Implementation of a Sound Information Age Model Requires a Common Vision of Technology and the Marketplace

Finally, effective development and implementation of an Information Age Model requires a common vision of technology and the marketplace. As exhaustively discussed in Section II, the traditional view of the telecommunications Network has no vitality. There is no Euclidean structure comprised of distinguishable piece parts. Today, and increasingly in the future, the network consists of highly integrated and highly substitutable elements. Attempts to draw "bright lines" are no longer feasible or practical.

In the *Computer III* decisions, telecommunications policy has been adapting to accommodate the new, integrated Information Age environment. Yet, even FCC policy is not entirely consistent in this vision. In examining trade issues, the FCC ignores its own advice and attempts to delineate between "core equipment" and other equipment as well as between carrier services and other services. This exercise in line drawing seems doomed to produce meaningless data of no use in assessing trade developments.

In the trade context, policymakers also still examine issues in their microcosm rather than macrocosm. Trade issues not only tend to be divided into goods versus services, but further disaggregated into discrete types of goods or services. This narrow focus can only result in distorted perceptions of trade data when applied to telecommunications in the Information Age.

The ultimate success of U.S. telecommunications and trade policy will increasingly depend upon our policymakers' ability and willingness to recognize the changes in the industry and the need for a common, shared vision of its future. This is a fundamental condition precedent to an effective U.S. public strategy for the Information Age.

Section VII — Conclusion